

Onion Extraction

Reagents:

- 95% Spirit, ice cold
- 1 organically grown onion
- 10 ml washing-up liquid
- 3 g salt
- 100 ml distilled water
- 2 glass beakers
- a fine kitchen sieve



Prepare the onion extract as follows:

1. Add the salt to the washing-up liquid. Make up to 100 ml with distilled water.
2. Cut the onion into small pieces roughly 5 mm square. Place the pieces in a beaker, then pour on the detergent / salt solution.
3. Stir the mixture and leave for 5 minutes.
This step causes the onion cell membranes to break down. The detergent forms complexes surrounding the membrane phospholipids and proteins, causing them to precipitate out of the solution. In addition, sodium ions from the salt shield the negatively charged phosphate groups of the DNA molecules causing them to coalesce. To prevent the DNA degrading too quickly, it can be heated to 60°C for 10min. At 60°C, DNase enzymes, which would otherwise start to cut the DNA into fragments, are partially denatured.
4. Cool the mixture in an ice water bath for 5 minutes, stirring frequently.
This slows the breakdown of DNA which would occur if the mixture was kept at 60°C for too long.
5. Filter the mixture into the second beaker through a fine sieve.
The filtrate that passes through the sieve contains soluble proteins and DNA.
6. Add a layer of ice-cold ethanol (vodka will do) on top of the onion extract / enzyme mixture by pouring it slowly down the side of the tube.
7. Leave the tube for 2–3 minutes without disturbing it.
DNA is insoluble in ice-cold ethanol. The DNA will precipitate in the ethanol as a white web of mucus-like DNA strands.

